

What Is Claimed Is:

1. A system for amplifying optical signals comprising:

5                   an optical fiber for carrying the optical signals; a high power broadband light source; and a connector for introducing the high power broadband light source into the optical fiber as a Raman pump so as to induce Raman amplification of the  
10                 optical signals within the fiber;

                  wherein the high power broadband light source is spectrally filtered so as to provide a desired spectral distribution for the Raman pump;

15                 wherein the spectrally filtered high power broadband light source comprises a spectrally filtered amplified spontaneous emission (ASE) generated from an optical component;

                  wherein the optical component comprises a plurality of ASE sources having their outputs combined  
20                 together so as to form a composite ASE source;

                  wherein the optical component comprises an optical waveguide comprising a wavelength seed section for

generating ASE and a power booster section for amplifying the ASE;

wherein the wavelength seed section comprises a plurality of separate wavelength seed subsections arranged in a parallel configuration, further wherein each of the wavelength seed subsections is arranged to produce ASE in a particular wavelength range, and further wherein each of the wavelength seed subsections comprises an independent electrical contact so as to allow dynamic tailoring of the desired ASE spectrum generated by the wavelength seed section; and

wherein the wavelength seed section is disposed between the power booster section and a high reflectance mirror, and further wherein the high reflectance mirror is configured to provide the desired ASE spectrum at the input to the power booster section.

2. A system according to claim 1 wherein the independent electrical contact of each of the wavelength seed subsections is in electrical connection with the p-side of the wavelength seed subsection.

3. A system according to claim 1 wherein the optical component further comprises an broadband power combiner for combining the outputs of the plurality of optical ASE waveguides into the power booster section.

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4. A system according to claim 1 wherein the high reflectance mirror comprises at least one element selected from the group consisting of a thin film 10 coating and a distributed Bragg reflector.

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5. A method for amplifying optical signals comprising:

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introducing a high power broadband light source into an optical fiber carrying the optical signals so that the high power broadband light source acts as a Raman pump so as to induce Raman amplification of the optical signals within the fiber;

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wherein the high power broadband light source is spectrally filtered so as to provide a desired spectral distribution for the Raman pump;

wherein the spectrally filtered high power broadband light source comprises a spectrally filtered amplified spontaneous emission (ASE) generated from an optical component;

5 wherein the optical component comprises an optical waveguide comprising a wavelength seed section for generating ASE and a power booster section for amplifying the ASE;

10 wherein the wavelength seed section comprises a plurality of separate wavelength seed subsections arranged in a parallel configuration, further wherein each of the wavelength seed subsections is arranged to produce ASE in a particular wavelength range, and further wherein each of the wavelength seed subsections 15 comprises an independent electrical contact so as to allow dynamic tailoring of the desired ASE spectrum generated by the wavelength seed section; and

20 wherein the wavelength seed section is disposed between the power booster section and a high reflectance mirror, and further wherein the high reflectance mirror is configured to provide the desired ASE spectrum at the input to the power booster section.

6. A method according to claim 5 wherein the independent electrical contact of each of the wavelength seed subsections is in electrical connection  
5 with the p-side of the wavelength seed subsection.

7. A method according to claim 5 wherein the optical component further comprises an broadband power combiner for combining the outputs of the plurality of  
10 optical ASE waveguides into the power booster section.

8. A method according to claim 5 wherein the high reflectance mirror comprises at least one element selected from the group consisting of a thin film  
15 coating and a distributed Bragg reflector.

9. A spectrally filtered high power broadband light source comprising a spectrally filtered amplified spontaneous emission (ASE) generated from an optical  
20 component wherein the optical component comprises a ridge waveguide.

10. A spectrally filtered high power broadband light source comprising a spectrally filtered amplified spontaneous emission (ASE) generated from an optical component;

5 wherein the high power broadband light source is formed using at least two discrete high power broadband light sources combined so as to yield a composite high power broadband light source;

10 wherein the at least two discrete high power broadband light sources are produced by a wavelength seed section comprising a plurality of separate wavelength seed subsections arranged in a parallel configuration, further wherein each of the wavelength seed subsections is arranged to produce high power  
15 broadband light in a particular wavelength range, and further wherein each of the wavelength seed subsections comprises an independent electrical contact so as to allow dynamic tailoring of the broadband light source.

20 11. A spectrally filtered high power broadband light source comprising a spectrally filtered amplified

spontaneous emission (ASE) generated from an optical component;

wherein the optical component comprises a plurality of ASE sources having their outputs combined 5 together so as to form a composite ASE source;

wherein the optical component comprises an optical waveguide comprising a wavelength seed section for generating ASE and a power booster section for amplifying the ASE;

10 wherein the wavelength seed section comprises a plurality of separate wavelength seed subsections arranged in a parallel configuration, further wherein each of the wavelength seed subsections is arranged to produce ASE in a particular wavelength range, and 15 further wherein each of the wavelength seed subsections comprises an independent electrical contact so as to allow dynamic tailoring of the desired ASE spectrum generated by the wavelength seed section; and

20 wherein the wavelength seed section is disposed between the power booster section and a high reflectance mirror, and further wherein the high

reflectance mirror is configured to provide the desired ASE spectrum at the input to the power booster section.

12. A spectrally filtered high power broadband  
5 light source according to claim 11 wherein the independent electrical contact of each of the wavelength seed subsections is in electrical connection with the p-side of the wavelength seed subsection.

10 13. A spectrally filtered high power broadband light source according to claim 11 wherein the optical component further comprises an broadband power combiner for combining the outputs of the plurality of optical ASE waveguides into the power booster section.

15 14. A spectrally filtered high power broadband light source according to claim 11 wherein the high reflectance mirror comprises at least one element selected from the group consisting of a thin film 20 coating and a distributed Bragg reflector.